City of Flagstaff

Public Works-

Solid Waste Section

2021 Solid Waste Plan

Overview

The Solid Waste Plan provides Leadership with a general overview of the Solid Waste program along with justification for capital expenditures over the next five-years.

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Executive Summary

In 2014, Flagstaff City Council (Council) adopted a set of goals for the community, one of which the following:

To provide sustainable and equitable public facilities, services and infrastructure in an efficient and effective manner to serve all population areas and demographics.

The City of Flagstaff Solid Waste Section (Solid Waste) responded to the goal by proposing the adoption a comprehensive Solid Waste Master Plan by July 2015. The SWP goals consist of the most relevant drivers of policy that fit within City Council goals. Any changes or additions to the existing program should be carefully vetted out through appropriate analysis (i.e. financial models and cost benefit analysis). The Solid Waste Plan (SWP) acts as a living document with relevant and up-to-date program goals and objectives of the Current City Council (2021).

Solid Waste offers a wide range of residential and commercial municipal solid waste (MSW) collection services within the boundaries of Flagstaff. In addition, limited trash services are offered to Coconino County residents and businesses.

While the financial outlook for Solid Waste remains fair, staff continuously adjusts its projections based on environmental regulations and market trends. With approximately 30 years of available airspace remaining at Cinder Lake Landfill (CLL), the facility assumes the role as the only regional landfill within the County. Although CLL is a valuable City asset, the facility will be required to absorb considerable costs for development of future cells ($5 million) and infrastructure ($8 million) in coming years.

Staff has noted disposal volumes consistently increase and decrease in a manner congruent to the Consumer Price Index (CPI). However, since 2017 disposal is inversely proportional to the CPI; in other words, while the CPI has been waning over the past few years, revenues remain steady within the Solid Waste program. The effects COVID-19 have also presented many unforeseen circumstances; residents are working from home are generating disposing of more MSW. While this has kept landfill revenues steady, it also has increased the costs to operate specialized services such as the Bulky Trash program.

The City efforts to increase diversion (recycling and reuse of materials) remains a priority. However, the state of the recycling industry is still in flux due to the Chinese ban on imports of recyclables. Staff will continue monitoring this with the cooperation of the Norton Environmental (Norton) Material Recovery Facility (MRF). In the meantime, staff is exploring options in anticipation of the 2023 expiration of our contract with Norton.

Even with a range of variables affecting the industry, the Solid Waste program continues to provide an exemplary level of service that Flagstaff and the County have come to rely on. Given the complexities of the economy at this juncture, staff recommends scrupulous vetting prior to committing to any new programs or services.

1 Operations Summary

Section 1 provides an overview of current services and the opportunities for growth within Solid Waste Section (Solid Waste).

1.1 Structure of Solid Waste Program

Solid Waste currently maintains the following operations:

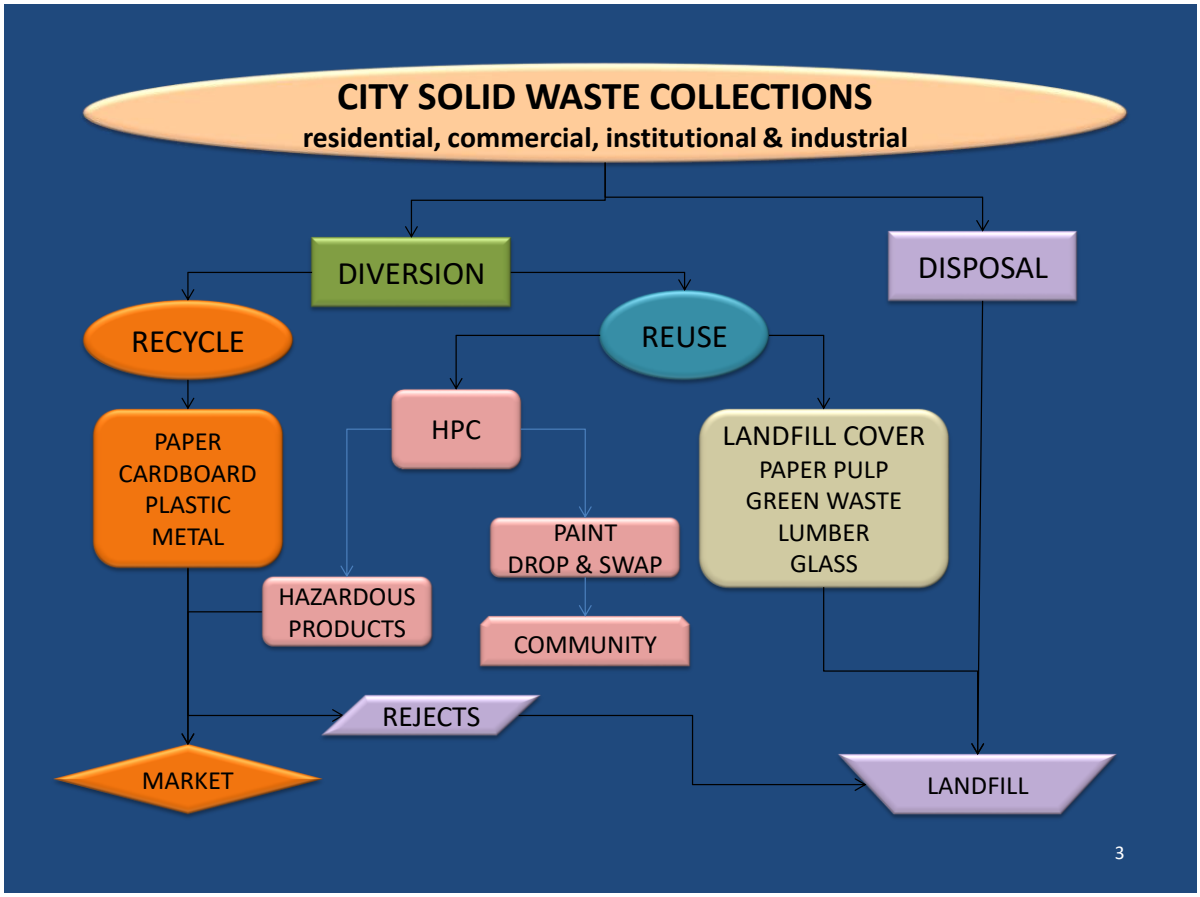

Figure 1-Solid Waste Structure

1.1.1 Cinder Lake Landfill

Cinder Lake Landfill (CLL) is the only permitted landfill within Coconino County. The facility is open to the public 6-days a week throughout the year from 7:00am to 4:30pm Monday thru Friday and 7:00am to 4:00pm Saturday. In 2020 the landfill accepted approximately 98,000 tons. The daily disposal rate is approximately 315 tons per day.

City residents can dispose of bulky items (non-construction debris) for free, while County residents are charged a rate of $20 per load (must be under 1 ton of waste). Otherwise, the tipping fee is $45.75 per ton (includes a $0.25/ton tax for the Arizona Department of Environmental Quality).

There is also a County residential drop-off site at CLL where residents can bring recyclable waste products (paper, cardboard, metal, glass, and plastic). We also provide free wood chips for all residents to haul on their own.

CLL has 12 employees on the payroll as follows:

Table 1-Landfill Employees

Title	Number of Employees
Manager	1 Full time Landfill Manager
Scalehouse	2 Full time and 1 part time employees
Operations	All Full Time Employees-1 Supervisor, 1 Lead Worker, 3 Operators, 1 Litter Picker
Project Management	2 Full time employees

1.1.2 Hazardous Product Center

The Hazardous Product Center (HPC) accepts approximately 173 tons of household waste from County and City residents every year. This waste includes approximately 45 tons of paint, 40 tons of electronic waste, 4 tons of batteries, and 47 tons of other household hazardous chemicals. This waste is sent to vendors who recycle or repurpose these waste streams.

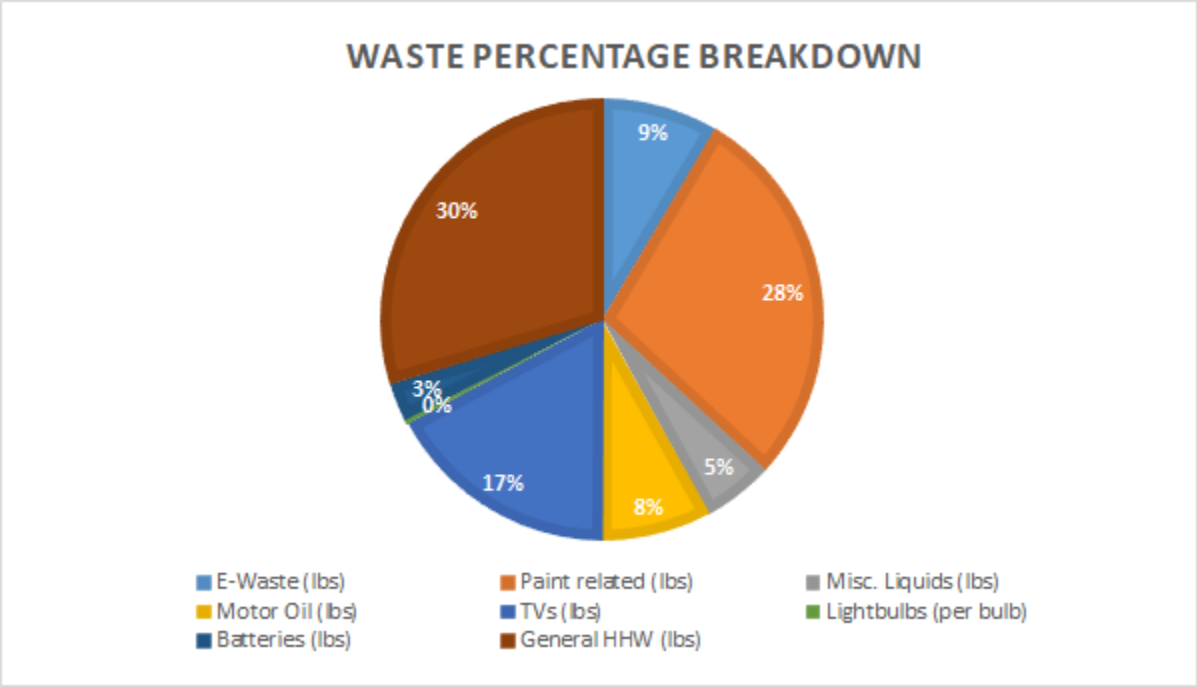

Figure 1-HPC Waste Characterization

There are 3 Employees at the Hazardous Product Center as follows:

Table 2-HPC Employees

Title	Number of Employees
Environmental Management Supervisor	1 Full time employee
Environmental Management Technician	1 Full time employee
Environmental Management Technician	1 Part time employee

1.1.3 Collections

Commercial and residential trash collection is conducted on a weekly basis by 28 employees. They are listed as follows:

Table 3-Collections Employees

Title	Number of Employees
Collections Manager	1
Collections Supervisor	2
Collections Lead Worker	2
Operator 3	6
Operator 2	6
Operator 1	9
Current FTE Vacancies	2

Residential Trash

The residential trash collection program is responsible for servicing approximately 19,000 homes weekly. Currently, the City is divided into 5 sections, or routes. Service days are Monday through Friday. The 5 operators who collect these areas work 8-hour shifts, Monday through Friday. In 2018, Council approved a 7.5% annual rate increase for residential trash collection through 2023.

Bulky Trash/Wood waste

This program is responsible for the curbside collection of household bulky items as well as tree limbs, yard waste, etc. The work is performed by 2 trucks with 2 operators each (3 Trucks beginning late in 21-22). The trucks are loaded with an articulated loader, purchased in FY 09/10. The loader increased productivity and efficiencies by capturing of this green waste, which provides a source of Alternative Daily Cover (ADC) for Cinder Lake Landfill.

Commercial Trash

The Commercial Collections program collects trash from commercial businesses, apartments and town homes. The operation runs 6 days per week. The operators work 10-hr shifts with staggered days to provide route coverage and meet customer service expectations. Since 2015, Arizona Senate Bill 1079 prohibited municipalities from excluding private solid waste haulers to enter the multifamily residential properties. At this point, the bill has only slightly affected the City commercial trash services. However as more multi-family housing is coming online there is potential that the City may lose out on valuable contracts in the future. In 2018 City Council approved a 3% one-time rate increase on commercial trash collection. This did not demonstrate any noticeable decrease in customer accounts.

Residential Bin Maintenance

This program is responsible for the delivery, pick-up, cleaning, and repair of residential curbside containers. Other duties include special events, collection of white goods (weekly), collection of move- in boxes, pre-baled cardboard, pick up and disposal of dead animals from Flagstaff's streets (dogs, cats, skunks, deer, etc.), snow removal when needed, and the operation of any and all solid waste collection vehicles when needed. The position may respond to customer "emergencies" after hours or on weekends.

Commercial Bin Maintenance
This program is responsible for all commercial and roll off container deliveries, repairs, painting and cleaning. Other duties include welding, fabrication, and design, delivery and pick up of temporary bins, repairs and fabrication of gates, enclosures, etc. The position has a high degree of interaction with internal and external customers on a daily basis and is a large factor in customer satisfaction & retention. Both bin maintenance programs respond to customer requests within 24-hours and we typically are able to provide same-day service. The position is also required to operate solid waste collection vehicles when needed.

Hoist & Haul (Roll Off)
This program services commercial and residential customers with a variety of needs. Construction materials, clean ups, grocery store and food service compactors (including NAU and Flagstaff Medical Center), recycling, and glass recycling drop off locations are all a part of this program. The program currently has 2 assigned operators who operate Monday through Friday, with some Saturday collections by request. The operators work a 5-day, 8-hour schedule in the fall and winter months when activity is slower. During the busy season they work 10-hour days.

Residential Recycling and Commercial Recycling
The residential curbside recycling program operates much like the residential trash program, with approximately 19,000 homes to service Monday through Friday. The commercial recycle program also operates similar to the commercial trash program and trucks operate from Monday through Friday.

From a global perspective, the recycled waste industry has been turned on its head over the past several years. In July 2017, the Chinese Ministry of Ecology and Environment (MEE) announced that as of January 1, 2018 they would no longer accept contaminated paper/cardboard and plastic.

In response, the EPA announced that it would work to establish national recycling goals based around a set of measures which are as follows:

- Reduce Contamination in Recycling
- Make Our Recycling Processing System More Efficient
- Strengthen the Markets for Recycled Materials

As of January 1, 2021 the Chinese Ministry of Ecology and Environment no longer will allow solid waste (recycling or other-wise) to be imported into the country (Recycling, 2020). China’s ban on the import of solid waste works in concert with the Basel Convention, which seeks to control exports and imports of most plastic scrap and waste from 187 different countries (EPA, Unknown). The United States in not currently signed onto the Basel Convention, which complicates the potential export of plastics to countries that could otherwise recycle the material in an ethical manner.

These series of events will require the industry and the nation as a whole to determine how far it is willing to go for recycling to become effective and successful. Otherwise, we may be set back 40 years. Therefore in order for recycling to become beneficial on all sides, the bulleted items need to be reinforced with additional measures. One such measure includes the development of regional recycle facilities. These facilities sort thousands of tons per day while providing a more efficient methods for guaranteeing feedstock to the industries that thrive on recycled goods. City staff are currently weighing the cost and benefit to sending recyclable waste to regional facilities in the Phoenix Metropolitan area.

The contract with Norton Environmental expires in 2023, and the cost to Our studies have conclude that sending this material is far more beneficial to ship recyclable goods to regional sorting facilities than it

Glass Collection
In addition to the four city glass drop-off sites and CLL, Collections offers glass collection to residential customers on a subscription basis ($4.41/month).

Administration
The administrative staff handles all dispatch and phone calls from the public. In addition, they provide support in accounting and book-keeping for the program. Administrative staff are posted at the Core Services Yard and CLL scalehouse.

2 Budget

2.1 Solid Waste Program

The projected budget demonstrates a balance between responsible fiscal policy and environmental stewardship over the next five years. Solid Waste disposal trends are typically reflective of consumer spending habits and thereby have historically followed the Consumer Price Index (CPI) for the Western Urban region (United States Department of Labor, Bureau of Labor Statistics, 2020)[OBJ]. However, since 2017 disposal rates have not trended along with the CPI (figure 5). The deviation from the CPI is in 2020 is likely due to the fact that COVID-19 has compelled citizens to take on projects around their homes while quarantining. Naturally, these homeowner projects bring construction debris to CLL. We will continue to monitor these anomalies, but our projections show that the Solid Waste fund will continue to remain solvent into 2021.

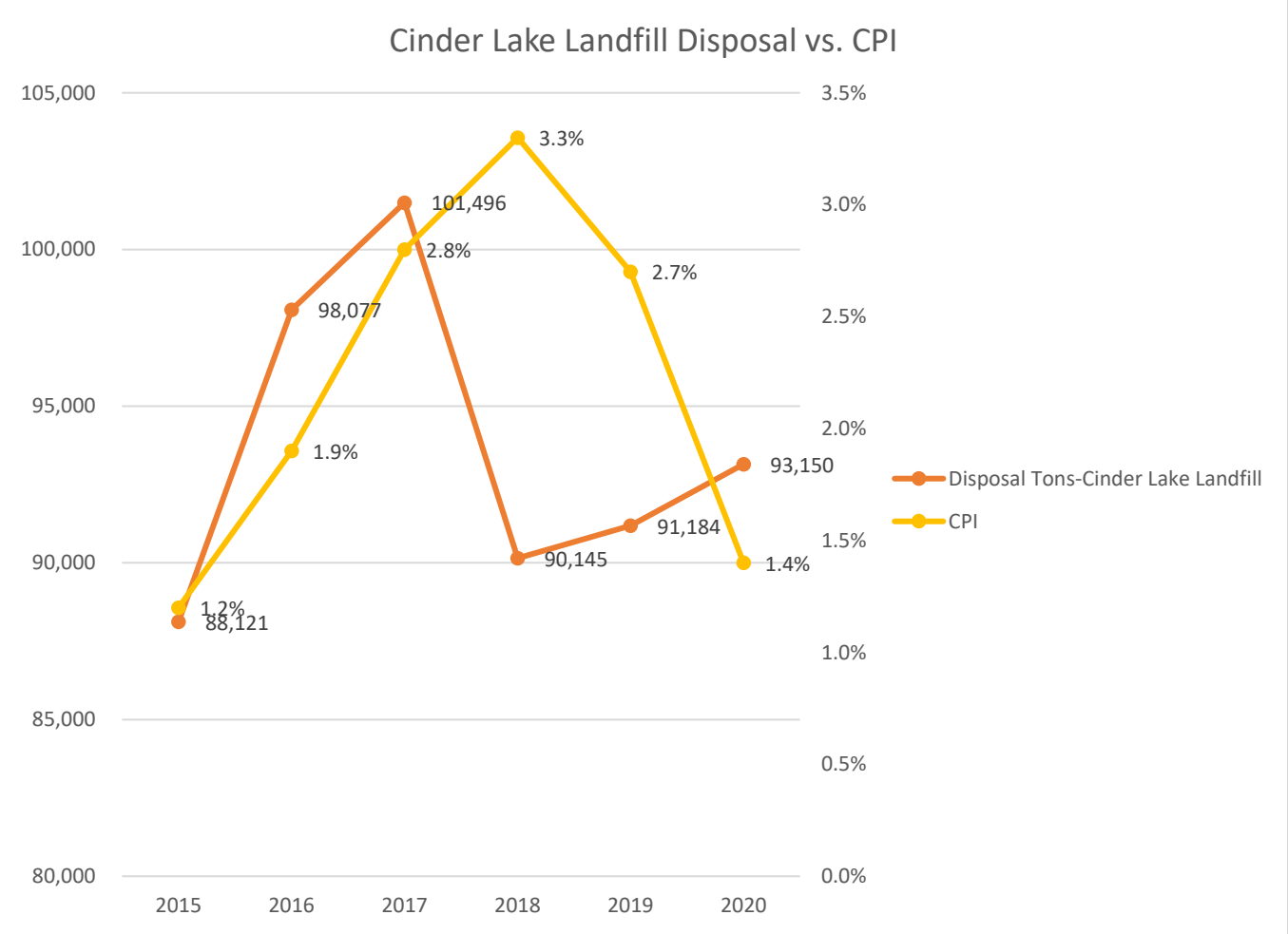

Figure 2-Cinder Lake Landfill Disposal Rates (Includes all weights-i.e. reconstruction debris)

The variability in disposal tonnage from 2015 through 2020 is something that we are adept in adjusting for. Nevertheless, a baseline budget is still required to accommodate capital expenditures needed to maintain minimum operational standards. This baseline budget is ranked on the following conditions:

1) Will the budget allow staff to run the Solid Waste with the necessary facilities, machinery, and equipment while keeping the operation safe and in compliance?
2) Do expenditures maintain the minimum required 10% fund bund balance?

In 2017 staff hired R3, a well-respected industry expert to assist in projecting whether a rate increase was necessary given the imminent capital improvement projects ($8.8 million) and fleet capital needs ($8.3 million). The result of the study indicated that rate increases in the following categories would be necessary:

- Residential Trash and Recycling Service-7.5% increase each year for 5 years
- Landfill Fees one-time 3% increase
- Commercial Trash and Recycling Service one-time 3% increase
- Hoist and Haul Service one-time 3% increase

The approved rate-increase ensured the Section would have sufficient revenue to meet their operational, capital, and debt service obligations as shown in Figure 6.

Figure 3-Solid Waste Five-Year Plan

A detailed timeline of all expenditures is represented in Figure 7. It's worth noting that the infrastructure needs of Cinder Lake Landfill, more-specifically rebuilding Landfill Road, will be the biggest one-time expenditure in program history. The initial price tag of $8.8 million is was generated based on the most conservative estimates. However, staff continues working with consultants to refine costs based on the most realistic trends in construction.

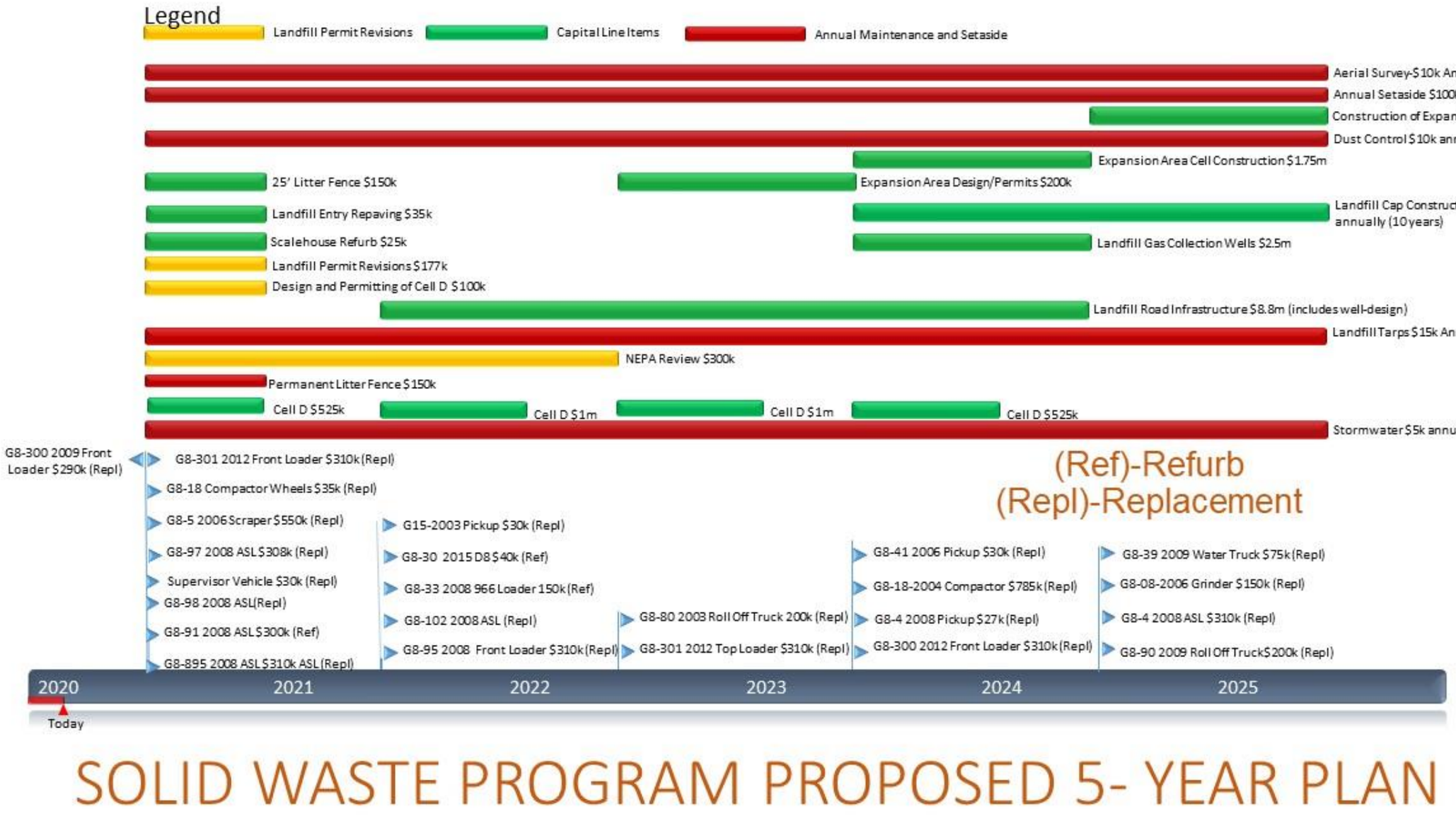

Figure 4-Five-Year Projection of Capital Expenditures

2.1.1 Collections Program

Budget projections- Collections staff has budgeted flat for FY21, with minor adjustments between line items and overtime projections to account for position vacancies, fuel costs and Fleet Services rate adjustments. Residential collections are expected to increase the coming years especially in high density in-fill areas for student housing. Staff is in the process of completing a rate study for Collections and the Landfill. An increase in the residential monthly trash bills will be justified to accommodate the $5 million withdraw over 20 years (approximately $300,000 per year) to fund the shortfall from the Core Services Yard. The results of the study will be published by spring 2018. The proposed Collections budget items for FY 21 include:

- Replacement of 4 American LaFrance Side Loaders-$300k each
- Replacement of Ford Taurus

2.1.2 Landfill Program

2.1.2.1 Landfill Road

Landfill Road (Road), also known as Forest Road 6010, is under the jurisdiction of the Coconino National Forest, Flagstaff Ranger District (Forest Service) and has been the primary access route to Cinder Lake Landfill (Landfill) since 1965. Recent structural evaluations of the Road conclude that the existing pavement is in irreparable condition. Subsequent to these evaluations, staff approached the Forest Service with a proposal to realign and rebuild the Road. However, in order to proceed with the formal review process, the Forest Service would need to initiate an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) guidelines. Staff is currently working with a Resource Consultant (EnviroSystems Management Inc.) and an Engineering Consultant (Shephard Westnitzer, Inc.) to develop a comprehensive application for NEPA review.

Preliminary designs indicate the extension of power, in addition to utility improvements will cost the City approximately $8.8 million. We are evaluating ways to value engineer costs lower in many respects. For example, rather than tapping into Doney Park Water, we are evaluating the feasibility of extracting water through an on-site well. The projected costs for this could be as much as $1.2 million. However, there are considerable financial advantages that would be realized by having an on-site well compared to paying monthly service fees to Doney Park Water.

2.1.2.2 Sequence D

Excavation of Sequence D is eminent and has been on the schedule for the past year. While the need for Sequence D is as much as 7 years away, plans require excavation of over 250,000 cubic yards of soil over the next couple years. The mining and excavation timeline requires us to have all that material cleared before we begin to lay down the necessary liner well ahead of the 7-year timeline. At this point the anticipated costs for excavation are projected to be $4 m over 5 years.

Other project line items for the FY 22 include:

- Landfill Compactor Wheel Replacement $35k
- NEPA Review for Infrastructure at CLL-$300k
- Annual Setaside Fund for Landfill Closure (on going)-$100k
- Portable Tarps for Daily Cover of the Landfill-$15k
- Stormwater Infrastructure-$10k
- Aerial Survey-$10k

- Landfill Gas Sampling-$35k

3 Infrastructure

Operational expenditures in Solid Waste have traditionally been scheduled around fleet rotation and minor capital expenditures. And while fleet capital is still an active part of the conversation, much of the focus has turned to larger capital projects at CLL (Landfill Road and the excavation of Sequence D).

3.1 Collections

Collections does not have any proposals to incorporate new infrastructure.

3.2 Cinder Lake Landfill

Over the past 10 years CLL has planned for large infrastructure upgrades. The remainder of Section 3 addresses these.

3.2.1 Landfill Road

Note that the projected costs to rebuild Landfill Road are preliminary and will be refined based on the Forest Service requirements (NEPA review) over the coming year.

3.2.1.1 Roadway Drainage Improvements, and Traffic Control

Asphalt pavement along Landfill Road (Road) is nearing its useful life and is beyond salvage (Speedie and Associates, 2017). The right of way is under the jurisdiction of the Forest Service. While the City was granted the use of the Road under a Forest Service Special Use Permit (SUP), the SUP has been expired for many years. The Road is maintained under a joint agreement between the County and the City. However, it does not meet the federal standards of the Highway Safety Act and the Manual on Uniform Traffic Control Devices (MUTCD). Redesign of the Road requires widening to accommodate additional shoulder widths, drainage, side-slopes, and overhead/underground utilities. The projected costs for roadway, drainage improvements, and traffic control are estimated to be $2.5 million. However, before any improvements can take place the project requires review by the Forest Service under National Environmental Policy Act (NEPA). The timeline for the NEPA process is approximately one year. Landfill staff is currently contracted with EnviroSystems Inc. to carry the permit through the approval process.

3.2.1.2 Power and Telecommunications

Currently CLL has single-phase power on site. In FY 2012, CLL used approximately 89,000 kWh of power, which cost approximately $14,000. This is a relatively small amount of consumption given the full potential of future demand at CLL. For instance, considerations for water (see below) require a reliable source of 3-phase power. If we had 3-phase power, we would also have the capacity to install a crane in the Maintenance Building. Lastly, landfill gas extraction systems if they become necessary would require blowers to be installed at CLL. The only source of power comes from the east side of Highway 89. It would be in the best interest of the City to consider installing telecommunications lines in the same overhead line. With that said, the right of way will limit traffic control along the Road, and it will be especially challenging when utilities are installed. Initial estimates the cost for three-phase power with telecommunications at approximately $1.7 million.

3.2.1.3 Water

Currently CLL relies on bi-weekly deliveries of potable water for its domestic needs. In the future, it will be necessary to have a reliable source water for fire and dust suppression. A six-inch diameter waterline

could be extended 1.6 miles from to an existing tee to CLL. However, Doney Park Water production rates do not provide enough pressure to suit the needs of the daily operations, therefore a booster pump and storage tank(s) would be necessary to provide reliable volume of water to the facility. The projected cost for the waterline would be approximately $1.5 million (includes $750,000 for the meter and control systems). If we consider digging our own well at Cinder Lake Landfill, it may outweigh the cost for installation of a Doney Park waterline. As mentioned above, staff is looking at this as a potential option. We currently are contracted with Tata and Howard to complete a preliminary evaluation for well sites. If the locations prove feasible then we may elect to conduct geophysics to validate the evaluation.

4 Other Projects Outlined in the 5-Year Plan

Five disposal cells are labeled in the existing design as Cells A through E (Figure 8). Cells A, B, and C (110 acres) contain MSW since 1965. Even though Cells A, B, and C are not lined, the landfill was permitted to continue placing MSW until the final design elevations are achieved. Subsequently, they will have to be finished with a cap that falls within regulatory guidelines. Cells A, B, and C will last another 5 to 7 years (depending on growth rates). Expanding the operation to Cells D and E (136 acres) will require design and construction of an approved liner.

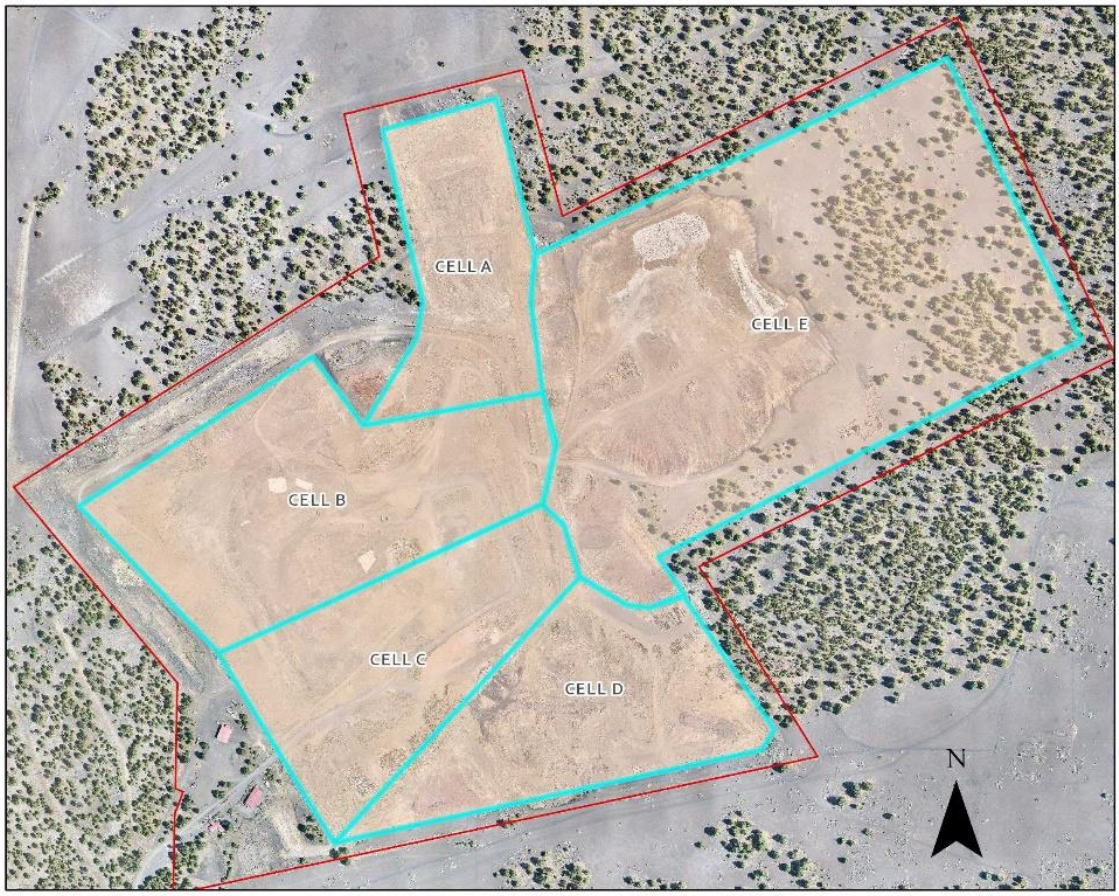

Figure 5-Map of Sequences at CLL

4.1 Gaining Efficiencies in Future Sequences

Although the closure of Sequences A thru C will not occur for 5 to 7 years, it is necessary to realize that those cells are more ideal to keep unfilled, while we develop the other cells. In consideration of the future construction, staff is exploring how we may be able to incorporate advanced technologies that would not only provide positive financial returns, but would also help subsidize the development of future sequences. In 2013 CLL investigated the beneficial uses of landfill gas for alternative fuel vehicles utilizing compressed natural gas (CNG) (Geosyntec Consultants, 2013). The study determined that there was a potential benefit in converting certain fleet over to CNG with the contingency that all fleet vehicles would be stored at Cinder Lake Landfill. However, it should be noted that CNG vehicles have not been sufficiently engineered for elevations above 5,200 feet. Power losses at 7,000 feet can be as much as 25% (Center, 2012).

Throughout the solid waste industry, landfills are searching for beneficial reuses of readily available sources of construction and demolition debris (Bratkovich, 2014). Grinding and pulverizing of debris such as wood and concrete respectively, can potentially conserve landfill airspace while providing a reliable resource for operational cover material. We know that there is a deficit of 1.3 to 1.5 million cubic yards of soil cover at CLL. Therefore, it is in the best interest of the facility to continually explore other cover resources for the facility.

4.2 Excavation of Sequence D and E

The CLL Solid Waste Facility Plan acts as the guiding construction document and prescribes excavation depths within the future expansion areas (Cell D and E). The depths established by the engineer of record were based on the elevations for marginally rippable (extractable) rock, as determined by drillers' logs and geophysical surveys. The engineer assumed that the desirable method of excavation was through mechanical removal by bulldozers and excavators with minimal blasting. Since that time there have been multiple excavations performed on-site. In addition, staff determined drilling and blasting will be a more practical method to successfully extracting rock and soil from the site.

In fall 2012, CLL embarked on an extensive drilling and sampling operation (Speedie and Associates, 2013). The mission of the project was to determine whether it was feasible to drill and blast below the prescribed elevation within Cell D. Results from the study indicate that excavation below the design elevation is potentially feasible based on the following considerations:

- The in-situ rock is a potentially valuable resource to consider as aggregate for future applications in roadway construction for the region. The nearest source of aggregate is located approximately 40 miles north of Flagstaff at the CEMEX Gray Mountain Plant.
- The "slag" generated from processing rock would decrease the existing soil deficit (1.2 to 2.6 million cubic yards).

Staff concluded that the existing design depth in Cell E could be exceeded by as much as 50 additional feet. However, the operation would need to consider mining portions of buried MSW within Cell C to achieve such elevations (additional discussions in Section 8 pertain to landfill mining). The additional airspace gained over that time is likely to result in another three to five years of landfill life. Based on this information, staff concluded that additional investigation is warranted.

In spring, 2021 Staff will solicit Requests for Qualifications (RSOQ) to qualified contractors for excavating and processing large volumes (approximately 240,000 cubic yards) of aggregate.

4.3 Alternative Daily Cover (ADC) Sources

There is currently not enough soil to cover the entire landfill through its operational life (approximately 30 years). For seventeen years paper millings from SCA Tissue (Flagstaff) were used as ADC. However, in June 2017 SCA closed operations. Although paper millings are no longer imported, there is still approximately 4 years of the material stockpiled at CLL. We are also using our grinder to divert as much green waste and lumber as possible for mixed use with paper millings. While we recognize the grinding operation as a benefit for the “greater good”, the cost of grinding wood debris costs over $250/hour.

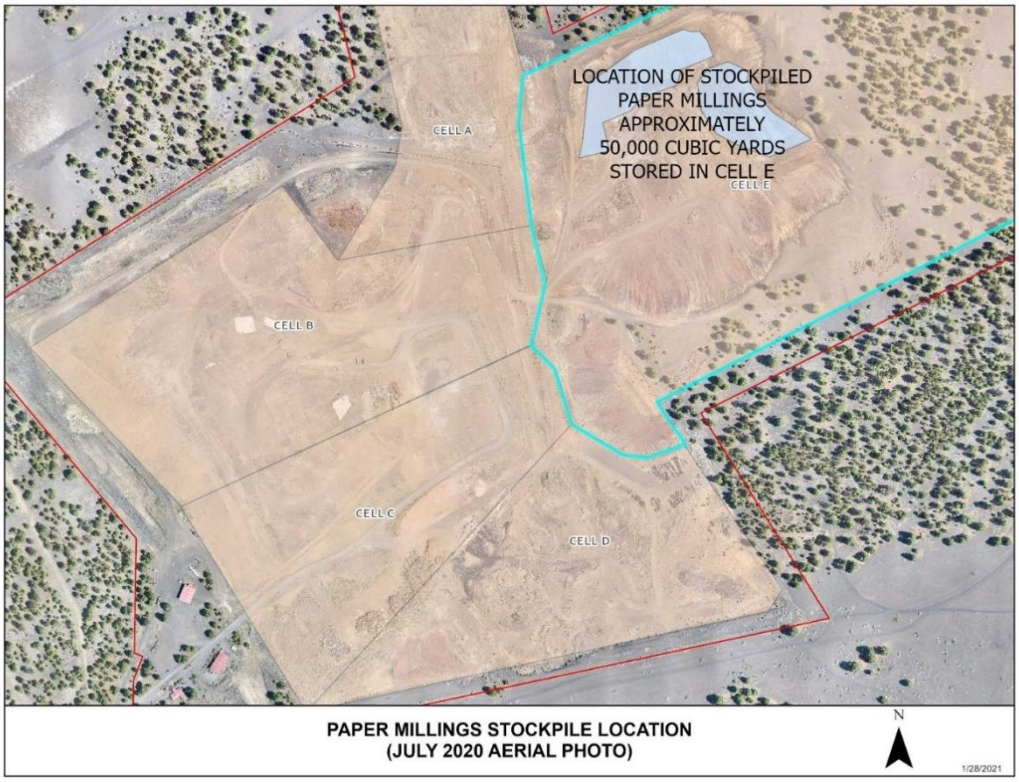

Figure 6-Paper Millings Stockpile Location

In response to the loss of imported paper millings, staff implemented portable tarps starting in lieu of paper millings (see Figure Below). They are placed at the end of the day and removed the following morning, thereby keeping the facility in environmental compliance while saving airspace.

Figure 7-Landfill tarps as alternative daily cover

Figure 10 provides insight to cover usage trends verses trash disposal at Cinder Lake Landfill. We see the consistent decrease of paper millings since 2018. Since the tarps have been implemented in 2019, there has been an average airspace savings of 6,900 cubic yards (approximately 10-days of added airspace per year). If tarps continue to be used, a savings of airspace will be realized to save the landfill as much as two years over the life of the facility. Conversely, we have seen higher rates of soil cover since 2017. The reason for the increase is that soil cover is that cells are being constructed at the landfill. Many of these cells have been on the outside slopes of the landfill and require intermediate cover in the form of native soil from our borrow pits. This typically means that cells will have to be covered on 3 to 5 sides, depending on the geometry. We will likely continue to see this soil usage until we move into future expansion areas.

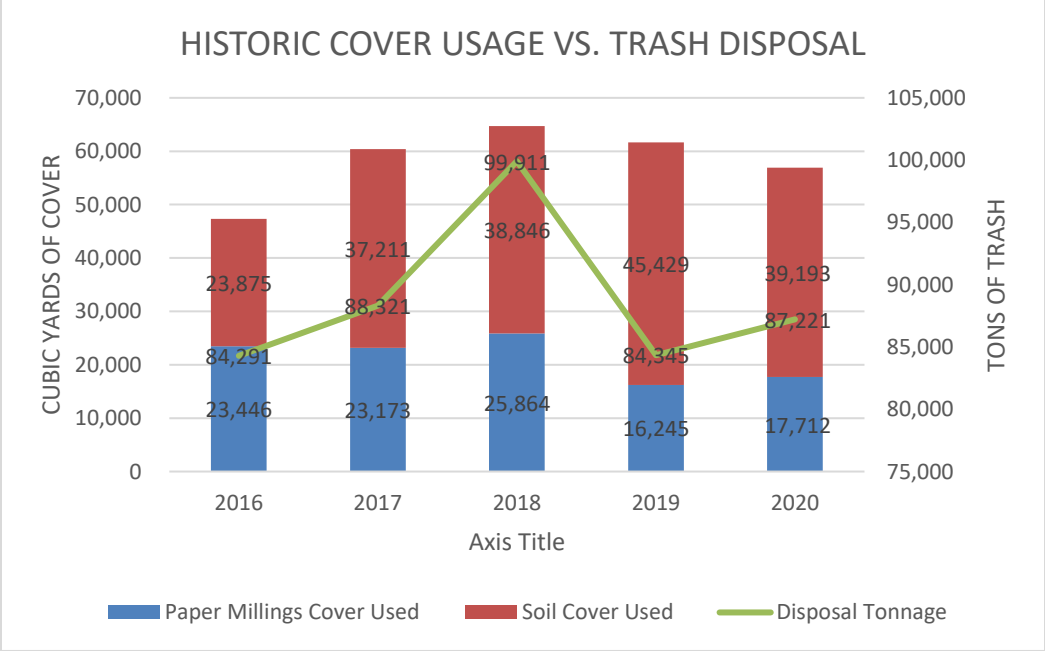

Figure 8-Cover usage measured against trash disposal in the active cells of the landfill. Disposal doesn't include Reconstruction Debris.

Staff is continuously reviewing other potential sources of ADC. For instance, since 2012 staff has received an average of 2,700 tons of inert reconstruction debris (concrete, block, and steel). The bulk of which consists of concrete and other crushable material. Reconstruction debris has traditionally been buried in designated cells at CLL. The reconstruction debris typically requires more dirt to cover. In addition, it can only be buried with a dozer due to the hazards of exposed metal (rebar and corrugated metal culverts). And while the revenue for reconstruction debris is favorable ($11.38/cy), the value of the airspace is typically worth more for MSW ($12.65/cy).

In 2019 staff initiated a program to accept clean concrete (no trash, metal, or dirt) for a 2-year period. We stockpiled approximately 500 tons, or 1,000 cy of clean concrete. It would take a minimum of 10 years to collect enough material to warrant crushing for daily cover. The costs to crush clean concrete weighed against the minor airspace savings result in a net negative financial outlook. However, staff has looked at the costs for processing mixed concrete (concrete with rebar). Scalehouse data indicates that the disposal of mixed concrete is significantly higher than clean concrete; and mixed concrete can provide much greater volumes of cover and gained airspace in a shorter period. Therefore, staff proposes to start stockpiling mixed concrete in March 2021.

Figure 9-Clean concrete stockpile

5 Other Programs Supported by Solid Waste

The Solid Waste program provides ancillary benefits to programs within the City limits and beyond. The following activities or programs are just some of the examples of support the program provides the following services:

County Cleanup Days

Each year from late May thru early June, the County issues a one-time voucher to County residents allowing them to dispose of MSW at no charge. Because the County tracks customer usage during this time, the project requires an increased level of administrative support from CLL.

Free public mulch
The public is free to pick up wood chips at the City Public Works Yard and CLL. The mulch is provided by various contractors who occasionally dispose of clean wood chips. The wood chip pile is maintained by CLL staff throughout the year.

Sustainability and Environmental Management Section
Projects that receive (or have received) direct support from Solid Waste include the following:

- Promotional mailings for recycling
- Manpower for collection and cleanup wildcat dump sites
- Public service events involving a community cleanup day

All other SEMS related events involving the need for solid waste and recycle bins

Flagstaff Fire Department Fuels Management Program
CLL has provided multiple levels of service for the fuels-reduction throughout the past. Subsequent to tree thinning, CLL allows customers to bring processed wood chips to the site at no charge. The wood chips are mixed with paper millings for ADC.

6 Municipal Solid Waste Diversion

Staff is working with SEMS to prepare a plan for increasing diversion of MSW from the waste stream. The plan, also known as Rethink Waste, has a great deal of momentum within SEMS and Council. Therefore, staff will be assisting SEMS to develop long-term initiatives that are intended to act as a framework for developing financially sustainable programs and services that increase material diversion and prevent waste (City of Flagstaff, AZ, 2017). Staff is working with Sustainability on exploring the possibility of installing a solar array on the capped portion of the landfill in approximately 2025. Staff is also working with the Forest service, COF Wildland Fire Operations, and GSI studying the feasibility of placing a demonstration Biomass processing unit that would process forest restoration/thinning biproducts and MSW.

7 Regulatory Compliance at CLL

7.1 Maintaining Regulatory Landfill Compliance

Landfill compliance at CLL typically comes with a fixed annual cost to the program (unless unforeseen exceedances occur). There are two Project Managers in Solid Waste that manage employee training, environmental monitoring, and reporting activities for CLL. The remainder of this section addresses any pertinent environmental considerations that could affect the operation.

7.1.1 Environmental Standards for Municipal Solid Waste Landfills

The provisions of 40 CFR Part 60, Subpart WWW apply to landfills that commenced construction, reconstruction or modification on or after May 30, 1991. In 2016, the EPA proposed revisions to the 1996 rules for lowering the thresholds for EG's. The 1996 rules required GCCS to be installed for landfills that exceed 50 Metric Tons per year (MT/yr) of Non-Methane Organic Compounds (NMOC). However, the revisions lowered those emissions to 34 MT/yr.

The samples from 2018 indicate that Cinder Lake Landfill is at 20.4 MT/yr, well under the 34 MT threshold. Based on projected disposal rates CLL will have peak gas production at 32 MT/yr in 2045 (Tetra Tech BAS, 2018). It should be noted that the current gas emission rates are based on an unlined landfill. When we move into the lined expansion cells (Sequences D and E), higher concentrations of NMOC's and methane are likely to be captured in those cells. While this does not pose any immediate concern, it is certainly something to be aware of in future budget discussions.

8 Conclusion and Recommendations

The framework of the Solid Waste Section demonstrates a multitude of services that are offered within the community and the region. The financial outlook for the program remains optimistic, and staff will continue to make necessary adjustments as the local and regional economy will allow. Environmental compliance is also essential to assuring the program remains a viable disposal option in the region for years to come. Management remains committed to balancing fiscal responsibility and environmental stewardship for the City and the region. Staff expects that the SWP will be a mechanism for management to communicate how it intends to achieve this balance over coming years.

Although the economy appears to be favorable for FY 21 and FY22, the Solid Waste program continues investigating where efficiencies can be realized.

Landfill Road is in imminent need of replacement. Therefore, landfill staff is committed to collaborating with the Forest Service through the NEPA process.

As CLL nears capacity in its existing cells, landfill expansion will become a relevant discussion piece in the coming fiscal years. The preparation and excavation of cells will present a particular challenge to the success of the operation.

The recycle industry is currently undergoing a global crisis resulting from China's ban on importation of recyclables. We anticipate that the hardship will be felt down to a local level as well. In the meantime, it will be important explore more-regional options for recycling.

Growth is expected to continue in Flagstaff for the near future due to the influx of student housing around the NAU campus. However, from the perspective of solid waste disposal, this growth is only reflected in a short-term basis from a construction and demolition standpoint.

Staff will make every effort to continue offering the level of service that the Citizens of Flagstaff and Coconino County have come to expect, and we will continue to monitor and adjust to the disposal trends in Flagstaff and the surrounding community.

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